SUPERFUND STANDBY PROGRAM
New York State
Department of Environmental Conservation
50 Wolf Road
Albany, New York 12233-7010

SITE IDs 259, 366, 367: NEW VENTURE GEAR, INC.

SITE SUMMARY REPORT
REVISED DRAFT

Onondaga Lake Project
Task 5: 104(e) Review

Site No. 734030-002
Work Assignment Number D003060-27

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DRAFT

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1.0 SITE DESCRIPTION

In general, the information referenced in this report was obtained from the 104(e) responses of New Venture Gear, Inc. (Company ID 2023). Four mailings were received from New Venture Gear, dated June 1, 1995, March 15, 1996, August 14, 1997, and June 26, 2000 (see TAMS' Completeness Reviews A and B, dated October 6, 1995 and October 25, 1996, respectively). Also, supplemental information and data were provided by NYSDEC (December 24, 1996).

1.1 Location

The New Process Gear Division of New Venture Gear, Inc. (NVG) is located in East Syracuse in the Town of Dewitt, Onondaga County, New York. The NVG East Syracuse facility (Site ID 259), at 6600 New Venture Gear Drive (Mailing No. 4, p. 1), is situated near the southwestern corner of the intersection of Chrysler Drive and Fly Road, and covers an area of approximately 112 acres. The site is bound by Consolidated Rail Corporation (Conrail, Company ID 2053) tracks to the south and west, Chrysler Drive and the New York State Thruway to the north, and Fly Road to the east.

On April 14, 1998, NYSDEC indicated in a letter to NVG that a document was located which identified two additional NVG sites at Plum Street and Wolf Street, both in Syracuse, New York, which were not described in the three previous NVG submittals. In response to this letter, NVG indicated that their company "did not own or operate any facilities at Plum or Wolf Streets" and "has operated since 1990 solely at the East Syracuse facility" (Mailing No. 4, p. 1). However, NVG did provide limited information about these two facilities which has been included in this Site Summary Report.

The Plum Street facility (Site ID 366) was located at the intersection of North Franklin Street and Plum Street, in Syracuse, New York, and was in operation from the "early 1900s to the late 1950s" (Mailing No. 4, p. 1). The Plum Street facility was bordered to the east by North Franklin Street, to the north by Plum Street, and to the south and west by Onondaga Creek (Mailing No. 4, p. 6). To the west of Onondaga Creek, storage facilities were used by the Plum Street facility owner that contained waste oil storage tanks (discussed in Section 2.3). These storage buildings were bordered by the NY Central Railroad to the south and west. A site plan dated January 1959 provided by NVG in Mailing No. 4 indicates that this plant was 7.25 acres.

The Wolf Street facility (Site ID 367) was located at 1001 Wolf Street in Syracuse, New York, and was in operation "from the mid to late 1940s until the mid 1960s" (Mailing No. 4, p. 1). The Wolf Street facility was bordered to the north by Sixth North Street, Fourth North Street to the south, Wolf Street to the east, and Hiawatha Boulevard to the west. Ley Creek is located approximately 2,000 feet northwest of this facility. A site plan dated January 1959 provided by NVG in Mailing No. 4 indicates that this plant was 5.8 acres.

Figure 1 shows the location of the three facilities in relation to Onondaga Lake. Site maps of the Plum Street and Wolf Street facilities were provided in Mailing No. 4 and are presented herein as Figures 2 and 3, respectively. These maps are not completely legible. Site maps of the East Syracuse facility are included as Figures 4 and 5.

1.2 Geology

The surficial geology of the Syracuse area was strongly influenced by the most recent glacial advance (Wisconsin age, 12,000 to 14,500 years ago). Syracuse occupies a region that was covered by Lake Iroquois, a large glacial lake situated in front of the ice margin. The broad flat-lying plains situated north from Syracuse to Lake Ontario were formed beneath Lake

Iroquois and are characterized by lacustrine fine sand and silt deposits. Additional glacial features common to the region are moraines, drumlins, U-shaped valleys, and meltwater channels.

Onondaga Lake and all its major tributaries lie within glacial meltwater channels. These features originally were conduits carrying meltwater at large volumes and high velocities away from the glacier. Sediment types characteristically found in meltwater channels are sands and gravels. These relict features form important water bearing and transmitting units which form an irregularly branching, net-like pattern.

The bedrock geology of the greater Syracuse area includes Lower to Middle Paleozoic age sedimentary rocks predominated by carbonate (dolostone and limestone), and shale, and containing some sandstone, siltstone, and evaporites. Bedrock directly beneath the sites (as well as underneath Onondaga Lake) is Silurian Vernon Shale (Rickard and Fischer, 1970) which has low permeability, but does possess secondary porosity due to fractures.

1.3 Hydrogeology

According to the Syracuse East USGS map, ground surface elevations at the NVG East Syracuse site range from approximately 410 to 450 feet NGVD. No soil characteristics or groundwater elevation data were provided by NVG for this facility. Based on surface contours, it can be expected that shallow groundwater will flow in a westerly direction towards Sanders Creek, a tributary of Ley Creek.

According to the Syracuse West USGS map, ground surface elevation at the Plum Street facility is approximately 390 feet NGVD. Based on surface contours, shallow groundwater is expected to flow from this facility in a westerly direction towards Onondaga Creek. According to the Syracuse West USGS map, ground surface elevations at the Wolf Street

facility range from approximately 400 to 410 feet NGVD. Based on surface contours, shallow groundwater is expected to flow from this facility in a westerly and northwesterly direction towards Ley Creek. No soil characteristics or groundwater elevation data were provided by NVG for the Plum Street and Wolf Street sites.

1.4 Surface Water Hydrology

Stormwater runoff, non-contact cooling water, and blowdown water from the 112-acre NVG East Syracuse site is collected in two on-site stormwater lagoons, mainly used for dissipation of heat. Water is subsequently discharged to the upstream end of Sanders Creek under a NYSDEC State Pollutant Discharge Elimination System (SPDES) Permit. The stormwater lagoons and their connections to Sanders Creek are shown in Figure 4 herein. Based on the USGS map, Sanders Creek is located approximately 2,500 feet from the NVG East Syracuse facility and approximately 2,000 feet from on-site stormwater lagoon #1. The elevation of Sanders Creek at its upstream end is approximately 400 feet NGVD.

According to the NYSDEC SPDES application, which was dated 1979 and provided in Mailing No. 1 (p. 000061), management of stormwater, non-contact cooling water, and boiler blowdown water consists of two on-site lagoons connected in series by a storm drainage ditch with an oil skimmer on the downstream lagoon (#1). The design flow of the system is one million gallons per day (MGD) with an actual flow of approximately 0.225 MGD to Sanders Creek. NVG East Syracuse facility discharge monitoring data for the two on-site stormwater lagoons were provided by NVG and NYSDEC and are summarized in Section 4 of this report. According to NYSDEC's December 24, 1996 letter in response to TAMS' Completeness Review B, the draft SPDES permit provided by NVG in Mailing No. 2 was finalized in March 1996 with no changes.

NVG did not provide surface water hydrology information for the Plum Street and Wolf Street facilities. Based on the USGS Syracuse West topographic map, surface waters in the vicinity of the Plum Street facility would most likely flow in a westerly direction towards Onondaga Creek, and surface waters in the vicinity of the Wolf Street facility would most likely flow in a westerly and northwesterly direction towards Ley Creek. The elevations of Onondaga Creek and Ley Creek near these facilities are both approximately 380 feet NGVD.

2.0 SITE HISTORY

2.1 Owners/Operators

The New Process Gear Division of New Venture Gear, Inc. has operated at the East Syracuse site since 1990. Acustar, Inc. operated this facility from 1987 to 1990 and the Chrysler Motors Corporation operated the facility from 1960 to 1987. According to Mailing No. 1 (p. 000003), NVG's response covers the entire period of operation of the facility (approximately 1960 to the present). In Mailing No. 4, NVG did not indicate what company or companies owned and operated the Plum Street and Wolf Street facilities. However, site plans of these two facilities, which are dated 1959 and are included as Figures 2 and 3 herein, indicate that the New Process Gear Division of the Chrysler Corporation was the operator of these facilities at that time. Also, an Onondaga County Industrial Waste Survey was provided which states that the Wolf Street facility was owned and/or operated by the New Process Gear Division of the Chrysler Corporation (Mailing No. 4, Exhibit 2, pp. 8-9). Information regarding the historical ownership of the Wolf Street facility, prior and subsequent to its ownership by the Chrysler Corporation, will be included in the R.E. Deitz Site Summary Report (TAMS, 2000, in preparation). In particular, R.E. Deitz indicated that the Wolf Street plant was leased to the New Process Gear Corporation in 1951, which became part of the Chrysler Corporation in 1957 (R.E. Deitz, Mailing No. 1, p. 1). R.E. Deitz purchased the facility in 1969.

2.2 Site Operations

Since 1990, the NVG East Syracuse facility has manufactured manual front-wheel drive automotive transmissions, four-wheel drive transmissions, and transfer cases. Chrysler Corporation and Acustar, Inc. conducted similar operations at the site. Manufacturing processes include wet grinding of ferrous metals, parts cleaning, cutting, turning, luberizing,

and handling of parts and metal chips. According to a 1983 Monitoring Report for the Chrysler Corporation (Chester Engineers, 1983), the plant produced an average of 715 manual transmissions, 700 manual transaxles, and 2,210 transfer cases each day (Mailing No. 1, p. 000157). During that time, approximately 2,100 employees worked a three shift, five-day-per-week schedule.

Facility operations at the Plum Street facility included the manufacture of transmissions and transfer cases from the early 1900s to the late 1950s (Mailing No. 4, p. 1). It was noted that raw materials of an unspecified type and quantity, were grinded, cut, and "turned into parts" (Mailing No. 4, p. 2). Detailed descriptions of these operations were not available for review.

The Wolf Street facility consisted of a "cast iron machine plant" that manufactured transmission cases from the "mid to late 1940s until the mid 1960s" (Mailing No. 4, p. 1). "The process generally would be the receipt of gray iron parts which would be grinded, cut, and turned into parts" (Mailing No. 4, p. 2). It was noted in an undated Onondaga County Waste Survey that the raw materials which were used at this facility included alkaline cleaners, hydraulic and lubrication oils, cutting oils, and ferrous materials (Mailing No. 4, Exhibit 2, p. 8). It was also indicated in the Onondaga County Waste Survey that water was used for "cooling, parts washing, heating, process steam, [and] sanitary facilities" (Mailing No. 4, Exhibit 2, p. 9). Oils that were stored at the Wolf Street site and wastewaters that were generated on-site are discussed in greater detail in Section 2.3. Detailed descriptions of the site operations, the final manufactured products, and the methods of processing raw materials were not available for review.

2.3 Generation and Disposal of Wastes

New Venture Gear holds an Onondaga County Department of Drainage and Sanitation (OCDDS) Industrial Wastewater Discharge Permit for release of process and sanitary wastewater at their East Syracuse facility to the municipal sanitary sewer, for ultimate treatment at the Syracuse METRO sewage treatment plant. Process wastewaters generated by facility washers, burnishers, luberizing systems, the drummed oil and cleaners storage area, grinding/machining areas, and chip hoppers, are treated by an on-site industrial waste treatment plant prior to discharge to the municipal sanitary sewer. Sanitary wastewater generated from washrooms and the cafeteria is released to the municipal sanitary sewer without treatment (Mailing No. 1, p. 000176). The Monitoring Report for the NVG East Syracuse facility (Chester Environmental, 1995) identifies an average flow of 0.083 MGD discharged from the NVG wastewater treatment plant to the municipal sewer system from December 1994 to February 1995 (Mailing No. 1, p. 000171). Process wastewater contains solids, heavy oils, cyanide, and metals (including cadmium, chromium, copper, lead, nickel, silver, and zinc). Treatment of industrial wastewater consists of batch treatment in one of three 250,000-gallon tanks for sedimentation and flocculation with the addition of chemicals (including aluminum sulfate and lime). Oily wastes are skimmed and pumped from the tanks for off-site recovery.

The NVG East Syracuse facility is designated as a small quantity generator pursuant to 6 NYCRR Part 372 (Mailing No. 1, p. 000004). General process wastes generated by NVG include grinding swarf (sludge), coolant/used oil, metal chips, freon, and trichloroethane. Grinding swarf and metal chips wastes are stored on-site in roll-off containers, storage bins, and trailers, and are subsequently transported off-site for disposal. Non-process wastes which are primarily generated by intermittent maintenance activities include maintenance paint, PCB-containing equipment, and radioactive waste. Table 1 summarizes quantities and disposal methods for these industrial process and non-process wastes.

Table 1: Disposal Quantities and Methods for New Venture Gear Industrial Waste Generated at the East Syracuse Facility

Waste Produced	Disposal Quantity	Disposal Method
Grinding Swarf from Wet Grinding Process (non-hazardous based on TCLP testing)	1,000 tons/year	Stored on-site in roll-offs, until transported off-site. Presently disposed of at Seneca Meadows Landfill and previously disposed of at Dewitt Landfill (1962 to 1987)
Coolant/Used Oil from Metal Chips Turning Process (non-hazardous)	0.3 to 1.3 million gallons/year	Stored on-site in wastewater treatment plant storage tanks, then transported off-site to disposal areas outside the Onondaga Lake watershed (Buffalo area, outside New York State, and Dewitt Landfill)
Metal Chips/Turnings (aluminum, steel, and cast iron) from Metal Chips Turning Process (non-hazardous)	10,000 to 15,000 tons/year since mid 1980s; volumes unknown prior to 1980s	Stored on-site in roll-offs, storage bins, and trailers, then transported to "In-State Handling/Disposal Facility" for recycling, including Roth Brothers Smelting in Syracuse
Non-hazardous luberizer sludge; heat catalyst; wet well sludge; wood blocks; refractory brick and asbestos from routine refurbishing and maintenance	Unknown	Stored in roll-offs and transported to Seneca Meadows Landfill (currently)
Freon from parts cleaning process	Average 3.5 tons/year (1991-1995)	Reclaimed on-site, as well as recycled at out-of-state facility
Maintenance paint	Average 450 lbs/month since 1993	Incinerated by out-of-state facility
PCB equipment	Average 2 tons/year since 1983	Incinerated by out-of-state facility
Radioactive waste	Negligible (instrument quantity)	Returned to out-of-state supplier

Source: New Venture Gear, Inc., Mailing No. 1, June 1, 1995 (pp. 000004-000006) and Mailing No. 2, March 15, 1996 (p. 000220).

Freon, a general parts cleaner and vapor degreaser, was used at the facility from 1986 to 1995. From 1986 to 1990, only minimal quantities of freon were used at the facility (analytical laboratory quantities). According to NVG (Mailing No. 3, p. 000236), there were no known disposal records for their East Syracuse facility prior to 1991, as freon likely volatilized during the laboratory procedures. A freon degreaser was installed at the facility in 1991. Freon wastes were recycled at an out-of-state Safety-Kleen Corporation facility from 1991 to 1995.

Process waste streams generated from manufacturing operations at the Plum Street facility were stated to be "not now known, but may have included: non-hazardous grinding swarf (volume, transporters and handling facilities - currently unknown); coolant/used oil (volume, transporters and handling facilities - currently unknown); and non-hazardous scrap metal (i.e., aluminum steel and cast iron) (volume, transporters and handling facilities - currently unknown)" (Mailing No. 4, p. 2). NVG indicated that oils were stored on-site in tanks at the Plum Street facility in the northwest portion of the site (see Figure 2). Tank capacities, contents, and the tank filling methods are noted in Table 2 herein. It was not specifically indicated whether Tanks A, B, D, E, F, and G were situated aboveground or underground, if they have since been removed, or if they have been inspected to determine their structural integrity. On the site plan, Tank C was noted to be a "scrap tank." Tank H was likely an underground storage tank because in Exhibit 1 of the fourth mailing (p. 5), it was noted that the loading truck that was used was to be "located directly above the tank." Spill prevention measures were not discussed for the stored oils in the information that was available for review. Two "outside storage areas" were also indicated on the site plan to the east of Onondaga Creek, however, the materials stored were not indicated in the documents that were available for review. It was not indicated in the documents available for review whether the storage tanks have been removed from the site.

Table 2: Storage of Bulk Oils at the Plum Street and Wolf Street Facilities

Tank ID	Capacity	Contents	Filling Method
Plum Street facility			
A	8,400 gallons	NP 6060 Cutting Oil	a) truck from northwest of tank area b) railcar from siding
B	8,400 gallons	Vartrol 255 Soluble Oil	a) truck from northwest of tank area b) railcar from siding
D	10,000 gallons	MS 40 Red Engine Oil	a) railcar from siding b) truck from north of the tank area (requires a minimum 40 ft hose)
E	10,000 gallons	Atlantic 36 Machining Oil	a) railcar from siding b) truck from north of the tank area (requires a minimum 40 ft hose)
F	10,000 gallons	NP 6058 SECO General Purpose Oil	a) railcar from siding b) truck from north of the tank area (requires a minimum 60 ft hose)
G	10,000 gallons	Diesel Fuel Oil	a) railcar from siding
H	8,000 gallons	NP 6200 Hydraulic Oil	a) truck located directly above tank b) railcar at siding
Wolf Street facility			
I	12,500 gallons	MS 40 Red Engine Oil	a) truck located alongside tank
J	12,500 gallons	Atlantic 36 Machining Oil	a) truck located alongside tank

Source: New Venture Gear, Inc., Mailing No. 4, June 26, 2000 (compiled from table dated January 27, 1959, pp. 5-7).

Generated process waste streams at the Wolf Street facility were noted to be similar to those generated at the Plum Street facility (Mailing No. 4, p. 2). Regarding waste disposal facilities, NVG speculated that the Smith Cartage Corporation and Contract Trucking in Syracuse, New York, may have been responsible for transporting the non-hazardous grinding swarf off-site to an unknown disposal facility from 1962 until the facility was closed. It was noted that from the early 1960s until the facility was closed, waste coolant and used oil may have been transported off-site to unknown final disposal facilities by Seitz Oil and Contract Trucking in Syracuse, New York. NVG also indicated that "scrap metal was likely taken to the Marley Scrap Yard in Syracuse, New York from the early 1960s until the facility was closed" (Mailing No. 4, p. 2). Two oil storage tanks were located at the Wolf Street facility, and the tank capacities, contents, and the tank filling methods are noted in Table 2. The locations of these tanks are shown in Figure 3 (Mailing No. 4, p. 7), however, it was not indicated in the documents that were available for review, whether there were any spill prevention measures followed at the facility, whether the tanks were aboveground or underground, or whether they have been removed.

3.0 POTENTIAL PATHWAYS FOR RELEASE OF HAZARDOUS SUBSTANCES TO THE LAKE SYSTEM

3.1 Soil

As described in Section 2.3, industrial wastes, which were either stored or reclaimed on-site, which includes grinding swarf, used oil, metal chips/turnings, and freon, represent potential sources of contaminants to the soil. Historic spills of petroleum products and oils, as well as leaking underground storage tanks (see Section 4.1) on the NVG East Syracuse site, are also sources of soil contamination. Immediate remedial and investigative efforts were undertaken by NVG following the recent spills. Subsurface soil contamination can be transported to the lake system via dissolution and subsequent groundwater migration. The extent of on-site contamination is described in Section 4.

In Mailing No. 3 (August 14, 1997), NVG states "there was no known disposal of PCBs on NVG property." NVG did indicate that PCB oil was found in two welders and a "closed loop" hydraulic lift in the 1980s which were retro-filled. A 1984 Hazardous Waste Manifest was provided in Mailing No. 3 (p. 000245) indicating that 580 gallons of PCB-waste liquids and one 55-gallon drum of PCB-waste solids were generated at the NVG East Syracuse site and disposed at a facility in Ohio. PCB transformers were routinely decommissioned at the facility and were disposed off-site. A time period for off-site disposal of transformers was not provided. Soil sampling data provided by NVG included results for metals only. It is not known whether soil samples collected on the NVG East Syracuse site were also analyzed for PCBs.

Information was not available regarding soil quality at either the Plum Street or Wolf Street facilities.

3.2 Surface Water

Stormwater runoff from the 112-acre NVG East Syracuse site is collected in two stormwater lagoons, and then subsequently discharged to Sanders Creek, a tributary of Ley Creek which flows into Onondaga Lake. NVG's most recent SPDES permit and application material identify a design flow of 1.0 MGD and an actual discharge of approximately 0.225 MGD of stormwater, non-contact cooling water, and boiler blowdown water to Sanders Creek. According to the SPDES application (Mailing No. 1, p. 000061), stormwater runoff, cooling water, and boiler blowdown water are conveyed to two lagoons (constructed in approximately 1974) in series with an oil skimmer on the downstream lagoon (#1). According to a SPDES discharge monitoring report, the average flow in November 1974 was 0.41 MGD.

Under the SPDES permit, NVG is required to monitor the effluent prior to discharge to Sanders Creek for flow, pH, oil and grease, temperature, and 1,1,1-trichloroethane. SPDES discharge monitoring reports (DMRs) from 1974 (November and December), 1986 (January to May), and 1995 (January, weekly logs) were included in NVG's first response (pp. 000200 to 000212). There were no reported violations of the SPDES permit (Mailing No. 1, p. 000011). NYSDEC also provided copies of SPDES monitoring data from 1984 (June to December), 1985, 1986 (January to May), and 1996 (April, May, and July to October) for the NVG East Syracuse facility. A discussion of NVG's recent monitoring data for the discharge from the downstream lagoon is provided in Section 4. In Mailing No. 2, NVG indicated that 1,1,1-trichloroethane was not included in any discharge monitoring reports after 1985 as it was discontinued at the facility in 1985. Limited confirmatory sampling of effluent from the NVG East Syracuse on-site treatment facility was performed in 1986 and is discussed in Section 4.

Information regarding surface water quality at or near either the Plum Street and Wolf Street sites was not available for review. The Plum Street facility is intersected by Onondaga Creek, a class C water body, about 1½ miles upstream of its confluence with Onondaga Lake. Ley Creek, a class C water body downstream of Beartrap Creek, is located approximately 2,000 feet northwest and downgradient of the Wolf Street site. An undated Onondaga County Industrial Waste Survey indicates that cooling water and heating water from the Wolf Street facility was discharged to the storm sewers. It is believed that these sewers discharged to Ley Creek.

3.3 Groundwater

There is potential for transport to the lake system through migration of contaminants from soil into groundwater, and subsequent transport to Sanders Creek via groundwater flow. Incidents of petroleum spillage at the East Syracuse site represent potential sources of groundwater contamination. As stated in Section 1.3, based on surface contours, surface drainage from the East Syracuse site is in a westerly direction towards Sanders Creek, a tributary of Ley Creek. It can be expected that shallow groundwater would also flow in a westerly direction. Groundwater elevation data were not provided by NVG. The extent of on-site groundwater contamination is described in Section 4.

Information regarding groundwater quality at the Plum Street and Wolf Street sites was not available for review.

3.4 Air

New Venture Gear supplied Air Emission Permits from 1983 to the present. These inspection certificates regulate the stacks at the NVG East Syracuse facility, which collect dust that is generated by machining operations on ferrous castings. These emissions

represent a local source of contaminants to the atmosphere with potential deposition to the ground surface and subsequent transport to the lake system via surface runoff.

Information regarding air quality or associated permits at either the Plum Street or Wolf Street facilities was not available for review.

3.5 County Sewer System

New Venture Gear included OCDDS Industrial Wastewater Discharge Permits for their East Syracuse facility for 1982 and 1996 in Mailing No. 1 (pp. 000089 and 000105, respectively). Pretreated industrial wastewater and sanitary wastewater have been discharged to the municipal sewers, which eventually flow into the Syracuse METRO sewage treatment facility. Process wastewater is collected on-site in three 250,000-gallon batch treatment tanks for chemical addition to aid in the removal of oily wastes. An average flow of 0.083 MGD of effluent was discharged to the sanitary sewer system from December 1994 to February 1995 (Mailing No. 1, p. 000171). In 1982, the on-site industrial wastewater treatment plant treated approximately 0.164 MGD (Mailing No. 1, p. 000158). According to a 1978 flow diagram, approximately 0.26 MGD of pretreated process wastewater was discharged to the sewer (Mailing No. 1, p. 000062).

New Venture Gear is required to monitor for metals, cyanide, and total toxic organics, at the East Syracuse facility pursuant to USEPA Metal Finishing Pretreatment Standards (40 CFR 433). A letter from the Onondaga Public Works Commission to the New Process Gear Division of Chrysler Corporation (January 28, 1960), provided in Mailing No. 3, indicates that process wastewater was discharged to the Ley Creek Sanitary District prior to diversion of flow to the METRO facility.

Regarding the Plum Street and Wolf Street facilities, NVG noted that "upon information and belief, both facilities would have discharged to the Onondaga County Publicly Owned Treatment Works [POTW] for some time during their operations" (Mailing No. 4, p. 3). Information was not available for review for the Plum Street facility. An undated Onondaga County Industrial Waste Survey was provided for the Wolf Street facility which, at the time of the survey, was owned by the New Process Gear Division of the Chrysler Corporation (Mailing No. 4, Exhibit 2, p. 8). The Industrial Waste Survey indicates that a total of 395,000 cubic feet (approximately 3 million gallons) of water were discharged by the Wolf Street facility. Of this water discharge, 250,000 cubic feet (1.9 million gallons) were discharged to the storm sewer system, and 145,000 cubic feet (1.1 million gallons) were discharged to the sanitary sewer system. The wastewater that was discharged to the storm sewer had been used for cooling and heating purposes (125,000 cubic feet or 935,000 gallons each), and the sanitary sewer discharge was composed of sanitary waste (50,000 cubic feet or 374,000 gallons) and process wastewater (95,000 cubic feet or 711,000 gallons). Furthermore, the sanitary sewage was "mixed with industrial waste." It should be noted that the units of measurement associated with the aforementioned wastewater discharge values listed in the Industrial Waste Survey were not clearly indicated. It is assumed that these waste volumes, which were obtained from the response to Questions 8 of the POTW waste survey, were written with cubic feet as their units of measurement, although the units were not indicated. This assumption has been made because cubic feet was used in the response to Question 5 regarding water usage on a monthly basis. It is also assumed (based on Question 5) that the aforementioned discharge volumes were presented on a monthly basis (the time period was not specified in the response to Question 8). According to the response to Question 10 of the survey, no studies or analyses of wastes were conducted by Chrysler Corporation's New Process Gear Division at the time this Industrial Waste Survey was submitted. OCDDS permits for both the Plum Street and Wolf Street facilities were not available for review.

4.0 LIKELIHOOD OF RELEASE OF HAZARDOUS SUBSTANCES TO THE LAKE SYSTEM

4.1 Documented Releases

In Mailing No. 1, New Venture Gear described a release of a non-hazardous coolant (containing soluble oil) from their East Syracuse facility to an "adjacent industrial pond," which occurred in the late 1960s. The coolant was skimmed off the pond, and transported to the facility's wastewater treatment plant. In Mailing No. 2, NVG explained that this was an "ornamental pond" which was owned by the Carrier Corporation and is no longer in existence. No analytical data were available for this incident.

In Mailing No. 3, an internal Chrysler Corporation correspondence (June 11, 1970) was provided which describes discharges of oil pollutants from the storm sewer line located on the NVG East Syracuse site, into the storm sewer ditches in June 1970 (Mailing No. 3, p. 000241). These discharges are believed to have resulted from the emptying of scrubbers or drums on the site by Chrysler Corporation personnel. Also in 1970, approximately ten gallons of oil entered a storm sewer during a maintenance project (Mailing No. 1, p. 000008). Remedial actions taken as a result of these incidents were not indicated in the documents that were available for review.

In Mailing No. 1, NVG described a December 1992 suspected release of petroleum as a result of a leaking underground storage tank at the East Syracuse facility. The tank was removed and the incident was reported to NYSDEC Region 7. In December 1994, a pipe failure occurred in the back-up fuel oil supply at the NVG East Syracuse facility. The resulting petroleum spill was reported to NYSDEC. Quantities of petroleum spilled and the extent of soil contamination for these two incidences were not documented, nor were the locations of these releases.

According to a March 21, 1991 letter from OCDDS to NVG-Acustar, a sample collected on January 9, 1991 from the industrial wastewater discharge of the East Syracuse facility exhibited a pH of 2.0, exceeding the effluent limitation range for pH (5.5 to 9.5) (Mailing No. 1, p. 000213). NVG-Acustar was directed to submit a report before April 1991, providing operational changes to ensure compliance with effluent limitations. This report was not included in the documents which were available for review. Also, based on a September 22, 1994 letter from OCDDS, New Venture Gear exceeded the effluent limitation for oil and grease (150 mg/L). A sample collected in July 1994 in an on-site sewer exhibited an oil and grease level of 251 mg/L (Mailing No. 1, p. 000214). The pH of the effluent at this time was within the acceptable range. NVG was ordered by OCDDS to perform resampling of the effluent from its East Syracuse facility and provide results along with chain-of-custody records before October 1994. A March 1995 Periodic Monitoring Report was provided documenting the results of the December 1994 to February 1995 monitoring program. These data are summarized in Section 4.2.1.

NVG stated that they have "no specific information involving the Wolf Street facility or Plum Street facility relative" to the release of either hazardous waste or industrial waste into the environment at these facilities (Mailing No. 4, p. 3). It was noted, however, in the Onondaga County Industrial Waste Survey that a total of 250,000 cubic feet (1.9 million gallons) of waste cooling water and heating water were discharged to the Wolf Street facility's storm sewer system on a monthly basis (see Section 3.5). Analytical data from this discharge were not available for review.

4.2 Threat of Release to the Lake System

4.2.1 Extent of Site Contamination

Analytical results are provided in this section for the NVG East Syracuse site regarding contamination that was detected in the site's soil, groundwater, industrial wastewater, and surface water. The extent of site contamination at the Plum Street and Wolf Street facilities was not indicated in the documents that were available for review.

Soil

Soil samples were collected on the NVG East Syracuse site, near the two on-site stormwater lagoons, near the wastewater treatment facility, and near the drum storage area (see Figure 5 for approximate location of soil borings). Soil samples were analyzed for volatile organics, semivolatile organics, and RCRA metals. The soil sampling dates for these analyses were not provided. It is assumed that these samples were collected in February 1993 during the same period as sampling of soil from monitoring well locations for toxicity (Mailing No. 3, p. 000247).

For each of the sampling areas on-site, volatile organics and semivolatile organics were not detected. Table 3 summarizes the analytical results provided by NVG for metals detected in on-site soil near lagoon #1, lagoon #2, the wastewater treatment facility, and the drum storage area. Sample results are grouped together for each of the four areas.

Based on Table 3, detected metals found in the wastewater treatment facility area which exceeded NYSDEC's recommended soil cleanup objectives (NYSDEC, January 24, 1994) include arsenic, barium, chromium, and mercury. The recommended soil cleanup objective for chromium is also exceeded in the drum storage area and near both lagoons, and the

Table 3: Concentrations of Metals in Soil from Borings on the East Syracuse Site

Sampling Area		Drum Storage Area	Wastewater Treatment Facility	Lagoon #1	Lagoon #2
Depth of Sample (ft)		6 - 20	7 - 20	7 - 40	40 - 41
Number of Samples		4	5	8	3
	Rec. Soil Cleanup Objective (ppm)	Concentration Range (ppm)			
Arsenic	7.5	2.2 - 3.5	10.8 - 29.6	<0.6 - 5.5	<0.6 - 1.8
Barium	300	39.0 - 61.4	24.2 - 487	9.7 - 68.8	13.9 - 31.7
Cadmium	1	0.3 - 0.6	0.3 - 0.6	<0.3 - <0.7	<0.6
Chromium	10	6.6 - 17.2	15.7 - 24.6	3.8 - 29.4	16.2 - 30.3
Lead	SB(200-500)	<5.4 - 6.0	17.9 - 39.5	<5.4 - 11.2	<5.7 - 13.6
Mercury	0.1	<0.1	<0.1 - 0.2	<0.1 - 0.6	<0.2 - 0.6
Selenium	2	<0.5	<0.5	<0.5 - <0.7	<0.6
Silver	SB(N/A)	<0.5 - <0.6	<0.6	<0.5 - <0.7	<0.6

Sources: NVG, Mailing No. 3, August 14, 1997 (pp. 000252-000255).
Recommended Soil Cleanup Objectives obtained from NYSDEC TAGM, #HWR-94-4046, January 1994.

Notes: SB = site background (Eastern USA Background).
N/A = Not available.

cleanup objective for mercury is also exceeded near both lagoons. Of the four areas, metals concentrations were the greatest near the wastewater treatment facility.

A summary of the analytical results provided by NVG for metals detected in soil borings completed as monitoring wells near lagoon #1 (MW-3), lagoon #2 (MW-1), the wastewater treatment facility (MW-2), and the drum storage area (MW-4) on the NVG East Syracuse site is provided in Table 4.

Based on Table 4, metals detected in soil at Monitoring Well 2, located in the vicinity of the NVG wastewater treatment facility, which exceeded NYSDEC's recommended soil cleanup objectives include arsenic, chromium, and mercury. Chromium concentrations also exceeded NYSDEC's recommended soil cleanup objective in soil at Monitoring Wells 3 and 4 located in the vicinity of lagoon #1 and the drum storage area, respectively. Mercury was also detected in excess of the recommended soil cleanup level at Monitoring Well 4.

Toxicity Characteristic Leaching Procedure (TCLP) testing was also performed on soil samples collected during installation of the monitoring wells. Soil samples were collected at two different depths at the location of Monitoring Wells 1, 2, and 3 (total of six TCLP samples). Only select volatile organics, including benzene, toluene, ethylbenzene, and xylenes, and select semivolatile organics, including naphthalene, were analyzed in the TCLP samples. These compounds were not detected in the TCLP extracts, indicating that the soil is non-hazardous. However, metals were not analyzed as part of the TCLP testing.

Groundwater

Four monitoring wells were installed on-site at the East Syracuse facility in 1992, after the December 1992 petroleum release (see Figure 5 for approximate location of wells). NVG provided groundwater analytical results for a 1993 sampling event. Samples were collected

Table 4: Concentrations of Metals in Soil from East Syracuse Facility Monitoring Wells

Location		MW-1	MW-2	MW-3	MW-4
Depth of Sample (ft)		45	30	41	21, 41
Number of Samples		1	1	1	2
	Rec. Soil Cleanup Objective (ppm)	Concentration (ppm)			
Arsenic	7.5	1.95	18.4	4.2	5.4, 0.8
Barium	300	66.6	107	74.9	82.3, 12.2
Cadmium	1	0.4	<0.6	<0.9	<0.6, <0.6
Chromium	10	8.2	15.3	10.4	12.1, 20.1
Lead	SB(200 - 500)	6.6	36.2	<9.4	7.9, <6.4
Mercury	0.1	<0.1	0.2	<0.4	<0.2, 0.6
Selenium	2	<0.6	<0.6	<0.9	0.6, <0.6
Silver	SB(N/A)	<0.6	<0.6	<0.9	<0.6, <0.6

Sources: NVG, Mailing No. 3, August 14, 1997 (p. 000256).
Recommended Soil Cleanup Objectives obtained from NYSDEC TAGM, #HWR-94-4046, January 1994.

Notes: SB = site background (Eastern USA Background).
N/A = Not available.

at each of the four wells and analyzed for volatile organics, semivolatile organics, and RCRA metals. For each of the monitoring wells sampled on site, volatile organics and semivolatile organics were not detected. Sampling results for the metals are shown in Table 5. Results of two groundwater samples were reported for each of the following wells: MW-1; MW-2; and MW-3. Results of one groundwater sample was reported for MW-4.

Based on Table 5, contaminants found at elevated concentrations in groundwater were similar to those found in the soil samples. Detected metals found in these groundwater samples which exceeded NYSDEC Class GA groundwater standards (6 NYCRR Part 703, June 1998) include arsenic, barium, chromium, lead, and mercury. These metals were detected on-site near the wastewater treatment facility (MW-2), lagoon #1 (MW-3), and lagoon #2 (MW-1). Barium and chromium were also detected near the drum storage area (MW-4), but at concentrations less than the groundwater standards. Concentrations were greatest at MW-3, near the western property boundary. It is not known whether additional groundwater sampling was performed subsequent to the initial sampling in 1993. No additional, more-recent data were provided.

Industrial Wastewater

As previously stated, the New Venture Gear East Syracuse facility discharges pretreated process wastewater to the Onondaga County municipal sewer system. In Mailing No. 1, NVG provided two monitoring reports prepared by Chester Engineers: Electroplating Guidelines Baseline Monitoring Report for New Process Gear Corporation, Chrysler Corporation (June 1983); and a Periodic Monitoring Report for New Process Gear Division, New Venture Gear (March 1995).

According to the June 1983 monitoring report, treated effluent from the on-site wastewater treatment facility was discharged at a flow of approximately 0.164 MGD in 1982. In May

Table 5: Concentrations of Metals in Groundwater on the East Syracuse Site

Location		MW-1	MW-2	MW-3	MW-4
	NYSDEC Class GA Groundwater Standard (μg/L)	Concentrations (μg/L)			
Arsenic	25	5, 17	18, 31	20, 40	<5
Barium	1,000	84, 565	499, 665	485, 1,210	42
Cadmium	5	<5, <5	<5, <5	<5, <5	<5
Chromium	50	<20, 84	21, 109	86, 368	24
Lead	25	<0.2, <10	<0.2, 32	<0.2, 56	<0.2
Mercury	0.7	<0.2, 51	<0.2, 44	<0.2, 60	<3
Selenium	10	<20, <25	<20, <25	<20 , <25	<5
Silver	50	<10 , <10	<10, 11	<10, <10	<10

Sources: NVG, Mailing No. 3, August 14, 1997 (p. 000257).
NYSDEC Class GA Groundwater Standards (Part 703 - Surface Water and Groundwater Quality Standards and Groundwater Effluent Standards), June 1998.

1983, a three-day sampling program was conducted at the East Syracuse facility. Grab samples of batch treatment effluent, prior to dilution with sanitary wastewater and prior to discharge to the sewer system, were collected at 30-minute intervals for a three-hour duration. A comparison of the data from the May 1983 effluent samples with the Electroplating Pretreatment Standards is provided in Table 6.

According to the March 1995 NVG monitoring report, industrial wastewater was discharged three times per week over a four to six-hour period from the on-site wastewater treatment plant, which resulted in a 0.083 MGD discharge to the sanitary sewer (Mailing No. 1, p. 000177). NVG's discharge of pretreated process wastewater and sanitary wastewater to the municipal sewer is regulated by the OCDDS. NVG is required to monitor for metals, cyanide, and total toxic organics, pursuant to USEPA Metal Finishing Pretreatment Standards (40 CFR 433) and OCDDS requirements. According to the March 1995 report, a four-day sampling program was conducted in December 1994. Grab samples of treated effluent were collected prior to dilution with sanitary wastewater and prior to discharge to the municipal sewer system. A comparison of the effluent data from samples collected in December 1994 and the Metal Finishing Pretreatment Standards is provided in Table 6.

Based on the May 1983 monitoring program, inorganics including cadmium, chromium, copper, lead, nickel, and total cyanide, were either not detected or were detected at concentrations less than the pretreatment standards. Zinc was determined to exceed electroplating pretreatment limitations. As stated in the June 1983 monitoring report, "even though zinc exceeds the Pretreatment Limitations, the treatment plant effluent has an acceptable total metals level" (Mailing No. 1, p. 000160).

Table 6: Comparison of East Syracuse Facility Industrial Wastewater Effluent Data with Pretreatment Standards

Parameter	Electroplating Pretreatment Standards (mg/L)		May 1983 WTP Effluent Grab Samples (mg/L)		Metal Finishing Pretreatment Standards (mg/L)		December 1994 WTP Effluent Grab Samples (mg/L)	
	1-Day Maximum	4-Day Average	1-Day Maximum	3-Day Average	Daily Maximum	Monthly Average	Daily Maximum	4-Day Average
Total Cyanide	1.9	1.0	<0.005	<0.005	1.20	0.65	<0.005	<0.005
Cadmium	1.2	0.7	0.02	0.02	0.69	0.26	<0.005	<0.005
Chromium	7.0	4.0	0.21	0.20	2.77	1.71	<0.01	<0.01
Copper	4.5	2.7	0.20	0.11	3.38	2.07	<0.01	<0.01
Lead	0.6	0.4	0.20	0.14	0.69	0.43	0.022	<0.021
Nickel	4.1	2.6	0.40	0.32	3.98	2.38	0.38	0.28
Zinc	4.2	2.6	5.2	4.0	2.61	1.48	0.051	0.037
Silver	-	-	-	-	0.43	0.24	<0.01	<0.01
Total Metals (Cu, Ni, Cr, and Zn)	10.5	6.8	6.0	4.4	-	-	-	-

Source: NVG, Mailing No. 1, June 1, 1995. Electroplating Guidelines Baseline Monitoring Report, June 1983 and Periodic Monitoring Report for New Process Gear Division, March 1995.

Based on the December 1994 data, there were no exceedances of the Metal Finishing Pretreatment Standards (40 CFR 433) nor the discharge limitations of the General Pretreatment Regulations (40 CFR 403.5). On December 7, 1994, a batch sample was detected with a pH of 10.2, exceeding the OCDDS acceptable range for pH (5.5 to 9.5), and was reported to OCDDS.

Surface Water/Sediment

As described in Section 3, stormwater runoff, non-contact cooling water, and boiler blowdown water, are collected in two stormwater lagoons at the East Syracuse facility and then subsequently discharged to Sanders Creek. NVG holds a NYSDEC SPDES permit for this discharge.

New Venture Gear (Mailing No. 1) and NYSDEC (December 24, 1996) provided discharge monitoring reports for: November and December 1974; June to December 1984; January to December 1985; January to May 1986; January 1995 (weekly logs); and April, May, and July to October 1996 for the discharge from the on-site stormwater lagoons. The reports include flow rate, oil and grease, pH, temperature, and total suspended solids. No violations of the SPDES permit were reported by NVG (Mailing No. 1, p. 000011). NVG indicated that 1,1,1-trichloroethane was not included in any discharge monitoring reports since it was discontinued at the facility in 1985 (Mailing No. 2, p. 000221). Confirmatory sampling of effluent from the NVG East Syracuse on-site treatment facility was performed in April 1986. 1,1,1-Trichloroethane was not detected (less than 2.0 μg/L) in three water samples. Monitoring data for 1,1,1-trichloroethane were not included in any of NVG's Discharge Monitoring Reports prior to 1986.

In 1996 and 1997, NYSDEC collected surface sediment samples from Sanders Creek, which is approximately 2,500 feet west of the NVG East Syracuse facility and 2,000 feet west of

the NVG stormwater lagoon #1. As noted in Section 1.4 and shown in Figure 4 herein, water from the NVG lagoons is discharged to Sanders Creek under a SPDES permit. The nearest Sanders Creek sediment samples that were collected by NYSDEC were in 1997 from the following sample locations: L106, which is north and upstream of Chrysler Drive (also referred to as Court Street, see Figure 1) near the upstream end of Sanders Creek; L105, which is approximately 300 feet south and downstream of L106; and L104, which is approximately 1,000 feet southwest and downstream of L105. It is uncertain exactly where the NVG lagoon discharge point into Sanders Creek is located, and whether the discharge point is upstream or downstream of these sample locations. The nearest Sanders Creek sediment sample that was collected during NYSDEC sampling in 1996 was at location L18, which is approximately one mile west and downstream of L104. Data from location L18 will not be considered in this analysis because it is situated on the opposite side of a large traffic circle (Carrier Circle) and stations L104 through L106 are more likely to reflect pollutant loading from the NVG East Syracuse facility.

Sample data from L104, L105, and L106 were compared to NYSDEC's sediment screening criteria (NYSDEC, 1999). For the organics criteria, an average value of 3% (or 30,000 ppm) total organic carbon (TOC) was used for the Sanders Creek sediments based on TOC measurements that were made at the three locations (TOC levels at sample locations L104, L105, and L105 were 4%, 2.1%, and 3.5%, respectively). The only inorganic compound which was detected at location L104 at a concentration which exceeded a NYSDEC screening criterion, and was greater in concentration than the upstream locations (L105 and L106) was arsenic. Arsenic was detected at concentrations of 9.6 ppm, 4.1 ppm, and 4.3 ppm at L104, L105, and L106, respectively. The arsenic concentration at L106 exceeded the NYSDEC Lowest Effect Level (LEL) of 6.0 ppm, but was much less than the NYSDEC Severe Effect Level (SEL) of 33 ppm. Zinc was the only metal detected at a concentration (568 ppm at location L106) that exceeded the NYSDEC SEL (270 ppm). It is not known if NVG is the source of this elevated level of zinc. PCB Aroclor-1254 was detected at a greater

concentration at L104 (140 ppb) than both L105 (not detected) and L106 (83 ppb). The detections of PCBs at locations L104 and L106 exceeded the NYSDEC Wildlife Bioaccumulation sediment criterion for PCBs in freshwater (42 ppb based on a 3% TOC), but not the NYSDEC Benthic Aquatic Life Chronic Toxicity sediment criterion (579 ppb based on a 3% TOC). These 1997 sampling data are presented in Table 7 herein.

In 1996 and 1997, NYSDEC collected surface sediment samples in Onondaga Creek in the vicinity of the NVG Plum Street facility. The nearest upstream sediment sampling location was at O6 (in 1996), south and upstream of the Plum Street site, however, this location was greater than one mile from NVG and will therefore not be used in this analysis. NYSDEC collected four nearby downstream sediment samples in 1997 at locations O103, O104, O105, and O106, which were all located to the west and within 1,000 feet of the NVG site. There were contaminant concentrations that exceeded NYSDEC screening criteria at these sample locations, however, the lack of a nearby upstream sample location and the presence of other nearby potential sources (e.g., combined sewer overflows) prevent definitive conclusions from being made regarding the effects of the NVG Plum Street site on Onondaga Creek sediment quality.

The NVG Wolf Street facility is located approximately 2,000 feet southeast of the Seventh North Street crossing over Ley Creek. The sediment samples that were collected by NYSDEC nearest to the NVG facility were sample locations L3, L4, and L5 in 1996, and L111 and L112 in 1997, which were all in the vicinity of where Ley Creek intersects with Seventh North Street. Data from these locations were not evaluated for this NVG Site Summary Report since location L4 was in Beartrap Creek upstream of Seventh North Street, and the Ley Creek stations were all adjacent to the Crouse Hinds Landfills (Company ID 2015, Site ID 246).

Table 7: Sanders Creek Sediment Concentrations near the East Syracuse Site that Exceed NYSDEC Sediment Screening Criteria

Analyte	Benthic Aquatic Life Chronic Toxicity [1]	Lowest Effect Level	Severe Effect Level	Wildlife Bioaccumulation [1]	Sample Location L104	Sample Location L105	Sample Location L106
SVOCs (μg/kg)							
Benz(a)anthracene	360				**420**	ND	**470**
PCBs/Pesticides (μg/kg)							
Aroclor-1254	579			42	**140**	ND	**83**
Aroclor-1260	579			42	**83**	ND	**170**
Inorganics (mg/kg)							
Arsenic		6	33		**9.6**	4.1	4.3
Copper		16	110		**21.1**	15.9	**28.6**
Iron		20,000	40,000		16,800	**28,400**	17,100
Lead		31	110		24	11.8	**44.2**
Nickel		16	50		15.3	**26**	**19.6**
Zinc		120	270		88.4	70.8	**568**

Sources: Sediment screening criteria are taken from NYSDEC Technical Guidance for Screening Contaminated Sediments, January 1999. NYSDEC's 1997 sediment data are taken from the NYSDEC/TAMS Onondaga Lake Project Database (only parameters that exceed NYSDEC screening criteria are shown).

Notes: 1 = These screening criteria are based on a sediment total organic carbon average of 3% in a freshwater environment.

Boldfaced values indicate sediment concentrations in exceedance of a NYSDEC Sediment Screening Criterion.

ND = Not Detected.

4.2.2 Migration Potential of Contaminants

Based on the soil and groundwater data provided for the East Syracuse facility, metals of concern include arsenic, chromium, and mercury. Analyses of soil and groundwater samples indicate a potential for transport of contaminants from soil to groundwater. Soil contamination can be transported to the lake system via dissolution and subsequent groundwater migration to the lake or its tributaries (Sanders Creek and Ley Creek). Also, there is potential for transport of contaminants in surface soil to the upstream end of Sanders Creek by erosion due to surface water runoff and dusting during dry, windy conditions.

Zinc and oil and grease were detected at elevated concentrations in process wastewater from the NVG East Syracuse treatment facility prior to discharge to the municipal sewer. These contaminants are likely partially removed from the wastewater prior to entering Onondaga Lake during treatment operations at the Syracuse METRO plant. It is possible that a portion of this contaminant loading is not removed from the waste stream and reaches Onondaga Lake. In addition, NVG has received Notices of Violation for pH measurements in effluent outside the acceptable range. However, once process wastewater from the facility reaches METRO, it is likely that pH is within the acceptable range due to dilution with other plant influent.

5.0 POTENTIAL FOR ADVERSE IMPACTS TO LAKE SYSTEM DUE TO A RELEASE OR THREAT OF A RELEASE

5.1 Hazardous Substance Characteristics

The pollutants of concern for New Venture Gear, Inc. at the East Syracuse facility have been determined to be arsenic, total chromium, and mercury as these parameters were detected in subsurface soil and groundwater on the NVG site at concentrations greater than the NYSDEC recommended soil cleanup objectives and Class GA groundwater standards, respectively. Zinc was also detected at elevated concentrations in the process wastewater discharged from the facility. However, although levels of zinc may have exceeded discharge standards at the point of entry to the sewer system, concentrations due to NVG that ultimately entered Onondaga Lake were likely much less due to dilution in the sewer system and treatment operations at the METRO plant. Data to determine potential contaminants of concern at the Plum Street and Wolf Street facilities were not available for review.

Standards/Criteria

NYSDEC recommended soil cleanup objectives for arsenic, chromium, and mercury are 7.5 ppm, 10 ppm, and 0.1 ppm, respectively. According to Part 703 of the Codes, Rules, and Regulations of New York State (NYSDEC, 1998), the class GA groundwater standards for arsenic, chromium, and mercury are 25 μg/L, 50 μg/L, and 0.7 μg/L, respectively. Based on electroplating pretreatment standards indicated in NVG's 1983 monitoring report, the one-day maximum standard for zinc is 4.2 mg/L. According to NVG's current OCDDS permit, the one-day maximum discharge limitation for zinc is 2.61 mg/L.

Mobility

Arsenic is considered relatively immobile in soil due to binding to particles. On the other hand, arsenic is extremely mobile in the aquatic environment due to cycling through the water column, sediments, and biota. The fate and mobility of arsenic in water is dependent on pH and Eh (the oxidation-reduction potential) conditions (USEPA, 1979). Arsenic can be transported via surface runoff and wind. Mobility of arsenic is affected by sorption and desorption. Arsenic may be sorbed to aluminum hydroxides, clays, iron oxides, manganese compounds, organic material, and soils (US Dept. of Health and Human Services, 1992). Soil microorganisms may also reduce a small amount to volatile forms (arsines).

The fate and mobility of chromium in soil is dependent on the pH, redox potential, and sorption characteristics of the soil. Chromium in soil is predominantly in the trivalent form and as an insoluble oxide, and is not very mobile in soil (US Dept. of Health and Human Services, 1991). Reduction of hexavalent chromium [Cr(VI)] to trivalent chromium [Cr (III)] is facilitated by low pH (US Dept. of Health and Human Services, 1991). Also, chromium in soil can be transported to the atmosphere as an aerosol or dust, or can be transported via surface runoff to receiving waters in soluble or bulk precipitate form. Chromium in soluble and unadsorbed complexes in soil can leach into groundwater, depending upon soil pH (US Dept. of Health and Human Services, 1991).

Mercury mobility is highly dependent on the speciation of the metal. Some of the complex ions are highly soluble while others are very insoluble. Metallic mercury and methylated mercury compounds tend to vaporize due to their high vapor pressure. In aquatic environments high in chloride, such as Onondaga Lake and parts of the watershed, the solubility of mercury may be greatly increased due to the formation of charged mercuric chloride complexes. Mercury also has a very high adsorption (partition) coefficient such that sediment transport is a primary transport mechanism. Mercury can remobilize after

deposition in bottom sediments through biomethylation where bacteria in the sediments metabolize metallic mercury into methyl mercury compounds. These compounds can be quite mobile in the environment and bioaccumulate in many aquatic organisms (USEPA, 1979).

Toxicity

Based on numerous studies in humans and animals on the toxic effects of ingested arsenic, most cases of toxicity have resulted from accidental, suicidal, homicidal, or medicinal ingestion of arsenic-containing powders. Consumption of contaminated food or drinking water has also been documented (US Dept. of Health and Human Services, 1991). Exposure to arsenic via inhalation may lead to lung cancer in humans (US Dept. of Health and Human Services, 1991). Most arsenic found in tissues of fish and shellfish is in a form that is not toxic (US Dept. of Health and Human Services, 1991).

Hexavalent chromium [Cr(VI)], is classified as a human carcinogen (USEPA, 1996). Epidemiological studies of chromate facilities in the United States have found an association between chromium exposure and lung cancer. Workers are likely exposed to both Cr(III) and Cr(VI), however, only Cr(VI) has been found to be carcinogenic in animals (USEPA, 1996). Chromium(VI) is also very toxic to aquatic organisms (USEPA, 1979). Exposure to high levels of Cr(III), although an essential element, via inhalation, ingestion, or dermal contact may cause serious health effects (US Dept. of Health and Human Services, 1991).

Mercury, in both organic and inorganic forms, is toxic to both humans and animals (ATSDR, 1989). The organic forms of mercury, such as methyl mercuric chloride, are usually considered more toxic than the inorganic forms such as mercuric chloride. Long-term exposure to either form of mercury can damage the brain, kidneys, and developing fetuses. Elemental mercury is not classified as to carcinogenicity while methyl mercury and mercury

chloride are classified as possible human carcinogens (IRIS, 1997). The primary route of exposure for the general population is the ingestion of methyl mercury in contaminated foodstuffs, especially fish. Methyl mercury is the form of mercury most readily accumulated and retained in the aquatic food chain (USEPA, 1979).

Persistence

Arsenic is very persistent in both water and sediment. Since arsenic is an element, it cannot be broken down at all and only dilution or removal affects the presence of this element (USEPA, 1979). Arsenic can undergo a complex series of transformations, including oxidation-reduction reactions and biotransformations involving methylation to arsines.

In surface waters, no data have been found that would indicate that photolysis, biodegradation, or volatilization are important fate processes of chromium (USEPA, 1979). Sorption and bioaccumulation are considered important aquatic fate processes. Chemical speciation plays an important role in the fate of chromium in surface water; conditions favorable to Cr(VI) will maintain chromium in soluble form while conditions favorable to Cr(III) will result in precipitation and partitioning to solids and to sediments (USEPA, 1979). Chromium is not considered as persistent in surface water compared to soil and sediment.

Mercury is very persistent in the environment. Since mercury is an element, it cannot be broken down at all and its concentration in environmental media is governed solely by dilution mechanisms. Because of its strong adsorption characteristics, mercury primarily concentrates in bottom sediments. Mercury can also enter the biologic environment as bacteria metabolize metallic mercury to methyl mercury. Once in the biologic cycle, mercury compounds can maintain a dynamic system of reversible reactions which lead to a steady-state concentration of methyl mercury in sediments and water. Once in the biologic cycle, methyl mercury is very persistent (USEPA, 1979).

Bioaccumulation

Arsenic is accumulated in fish from both water and food. However, concentrations of arsenic in fish are generally low. Arsenic tends to bioaccumulate in marine algae and shellfish. Arsenic is not expected to biomagnify in the aquatic food chain (US Dept. of Health and Human Services, 1991).

Bioaccumulation of chromium in aquatic organisms and passage through the food chain has been demonstrated (USEPA, 1979). However, chromium concentrations decrease with an increase in trophic level. Chromium is not expected to biomagnify in the aquatic food chain (US Dept. of Health and Human Services, 1991). Also, chromium does not biomagnify along the terrestrial food chain from soil to plant to animal (US Dept. of Health and Human Services, 1991).

Methyl mercury is the most readily accumulated and retained form of mercury in aquatic biota. Bioconcentration factors can be high for many biota. The depurative half-life of methyl mercury in aquatic organisms has been estimated between one and three years (USEPA, 1979).

5.2 Quantity of Substance

Concentrations of arsenic, chromium, and mercury in soil and groundwater at the East Syracuse facility are summarized in Tables 3, 4, and 5 in Section 4. Estimates of the total mass of these contaminants in on-site soils cannot be made based on the available data. NYSDEC sediment data from locations in Sanders Creek adjacent to the East Syracuse facility are provided in Table 7 for parameters that exceeded NYSDEC screening criteria at three nearby stations.

The quantity of zinc originating from NVG's East Syracuse facility discharge and ultimately entering the waters of Onondaga Lake cannot be estimated as the discharge was not direct. In May 1983, a grab sample of effluent from the NVG East Syracuse facility treatment plant exhibited a zinc concentration of 5.2 mg/L (see Table 6). Average flows during this time were approximately 164,000 gallons per day (gpd). Thus, at a concentration of 5.2 mg/L with this average flow, the zinc loading to the sewer system would be about 7 pounds per day (lb/day). Zinc concentrations detected in effluent in 1994 were significantly less than concentrations detected in 1983. It can be assumed that a considerable portion of the zinc loading that entered the sewage treatment plant settled out of the wastewater and was disposed as sludge. Only a fraction of the zinc loading could be expected to pass through the system and actually enter the waters of Onondaga Lake.

NVG also received a Notice of Violation in July 1994 for an excessive concentration of oil and grease (251 mg/L). In the NVG March 1995 monitoring report, the flow to the sewer system during this period was 83,000 gpd (Mailing No. 1, p. 000171). Thus, an estimated loading of oil and grease during this period of violation was approximately 174 lb/day.

No information was available for review regarding the discharge or release of wastes into the environment from the Plum Street facility. According to the Onondaga County Industrial Waste Survey included in Mailing No. 4 (Exhibit 2, pp. 8-9), 125,000 cubic feet (935,000 gallons) of cooling water and 125,000 cubic feet of heating water were discharged into the storm sewer system from the Wolf Street site on a monthly basis (see Section 3.5). Process wastewater (95,000 cubic feet or 711,000 gallons) from the Wolf Street site was discharged into the sanitary sewer system on a monthly basis. No sample results were available for review for discharged cooling waters, heating waters, and process wastewater at this facility.

5.3 Levels of Contaminants

A summary of on-site soil and groundwater analytical data, off-site sediment data, and wastewater effluent data is provided in Section 4 for the East Syracuse site. Surface water data from samples in on-site ditches or off-site in Sanders Creek were either not collected or not provided by NVG.

Environmental data for the Plum Street and Wolf Street sites were not included in the documents that were available for review.

5.4 Impacts on Special Areas

The nearest New York State Freshwater Wetlands area (SYE 8) to the NVG East Syracuse facility is located approximately ½ mile north of the site and on the opposite side of the New York State Thruway. This area is not likely to have been impacted by contaminants generated by NVG. A federal wetland area, classified as POWZx (Palustrine, open water, intermittently exposed/permanent, excavated) on the United States Department of the Interior, National Wetlands Inventory (NWI) Map of Syracuse, is located on the NVG East Syracuse site, approximately 2,000 feet from the upstream end of Sanders Creek. This wetland is identified as lagoon #1 in NVG's responses. As described in Section 1, the lagoons collect stormwater runoff, non-contact cooling water, and blowdown water from the facility and the site, prior to discharge into a ditch leading to Sanders Creek. There are no other federal wetland areas near the site. Sanders Creek near the site is currently a class C stream and is not considered a "protected stream" in New York State. As per 6 NYCRR Part 608 (Use and Protection of Waters), protected streams are those streams with the following classifications or standards: AA; AA(T); A; A(T); B; B(T); or C(T). As of August 1996, there were no New York State "Natural Heritage Sensitive Elements" known in the immediate vicinity of the NVG East Syracuse site. Thus, the NVG East Syracuse site is not

situated in an area where direct future adverse impacts to protected streams or habitats are likely to occur.

The New York State freshwater wetlands nearest to the Plum Street facility are located along Onondaga Lake, between 1 and 1¼ miles to the northwest and downgradient. Wetland SYW 12 is situated between the mouths of Onondaga Creek and Ley Creek. Wetland SYW 19 is situated near the mouth of Harbor Brook. The nearest federal wetland area is classified as POWFx (Palustrine, open water, semipermanent, excavated), and is located less than 200 feet north of the site. The nearby Barge Canal Terminal (approximately 2,000 feet to the northwest and downgradient) is also a designated federal wetland and is classified as R2OWHx (Riverine, lower perennial, open water, permanent, excavated). As of August 1996, there were no New York State "Natural Heritage Sensitive Elements" within one mile of the Plum Street site. As noted in Section 3.2, the Plum Street facility is intersected by Onondaga Creek, a class C water body, approximately 1½ miles upstream of its confluence with Onondaga Lake. The federal wetland area north of the Plum Street facility, as well as Onondaga Creek and Onondaga Lake, could have been impacted if there were environmental releases from the Plum Street facility, however, no such releases were indicated in the documents that were available for review.

The Wolf Street facility is located approximately 1,000 feet to the east of a New York State freshwater wetland which is designated SYW 11 and is downgradient of the facility. A federal wetland area, classified as PEM1Cs (Palustrine, emergent, persistent, spoil) on the Syracuse West NWI Map, is located approximately 3,500 feet to the southwest and downgradient of the Wolf Street site near the mouth of Ley Creek. As of August 1996, there were two New York State "Natural Heritage Sensitive Elements" known in the vicinity of the Wolf Street facility. These areas are located along the southeast shore of Onondaga Lake, approximately one mile to the west of the Wolf Street site. Ley Creek, a class C water body downstream of Beartrap Creek, is located approximately 2,000 feet northwest and

downgradient of the Wolf Street site. As noted with the Plum Street facility, no environmental releases from the Wolf Street facility were indicated in the documents that were available for review.

6.0 SUMMARY OF CONCERNS

Based on the information and data provided by New Venture Gear, the following concerns are noted:

- New Venture Gear and prior owners of the East Syracuse facility (Acustar, Inc. and Chrysler Corporation) have historically released pretreated industrial wastewater to the municipal sewer system. The 1983 monitoring report indicated that the effluent complied with the federal limitations for total cyanide, cadmium, chromium, lead, and nickel. However, concentrations of zinc were greater than the applicable pretreatment standards. It was recommended that additional pretreatment facilities be constructed. The 1995 monitoring report indicated that the applicable limitations for the plant effluent were being met, including zinc. Also, NVG received Notices of Violation from OCDDS for excessive concentrations of oils and grease in their effluent as well as pH measurements outside the acceptable range.

- Soil samples were collected in 1993 at various locations and depths throughout the East Syracuse site. Concentrations of select metals, including arsenic, chromium, and mercury, exceeded the NYSDEC recommended soil cleanup levels. The source of the metals contamination in on-site soils was not indicated by NVG. These contaminants could be transported off site to Sanders Creek by surface water runoff and/or groundwater migration. The NYSDEC surface sediment data from locations near the upstream end of Sanders Creek indicate that concentrations of chromium and mercury were less than the NYSDEC screening criteria (Lowest Effect Level), while concentrations of arsenic exceeded the Lowest Effect Level at one of the locations. Concentrations of zinc exceeded the NYSDEC Severe Effect Level at the most upstream location.

- Limited groundwater sampling was also conducted in 1993 at four wells on the East Syracuse site. Concentrations of select metals, including arsenic, chromium, lead, and mercury, exceeded NYSDEC's Class GA groundwater standards. Groundwater elevation data were not provided to indicate the direction of groundwater flow nor the potential direction of contaminant migration. It is not known whether additional groundwater sampling was performed subsequent to the initial sampling in 1993.

- Based on the nature of operations at the Plum Street and Wolf Street facilities, it is possible that contamination may have occurred at these sites. The Plum Street site was directly adjacent to Onondaga Creek and the Wolf Street site was approximately 2,000 feet from Ley Creek. As noted in Table 2, there were a total of nine oil storage tanks located on the grounds of these sites which could have been potential sources of contamination to the subsurface. However, analytical data were not available for review for the underlying soil or groundwater, and the current status of the sites and extent of remediation, if any, were not indicated by NVG. Additional investigation of the environmental condition of these sites (where operations similar to the NVG East Syracuse facility were performed) is recommended to determine if these two sites have impacted the Onondaga Lake system.

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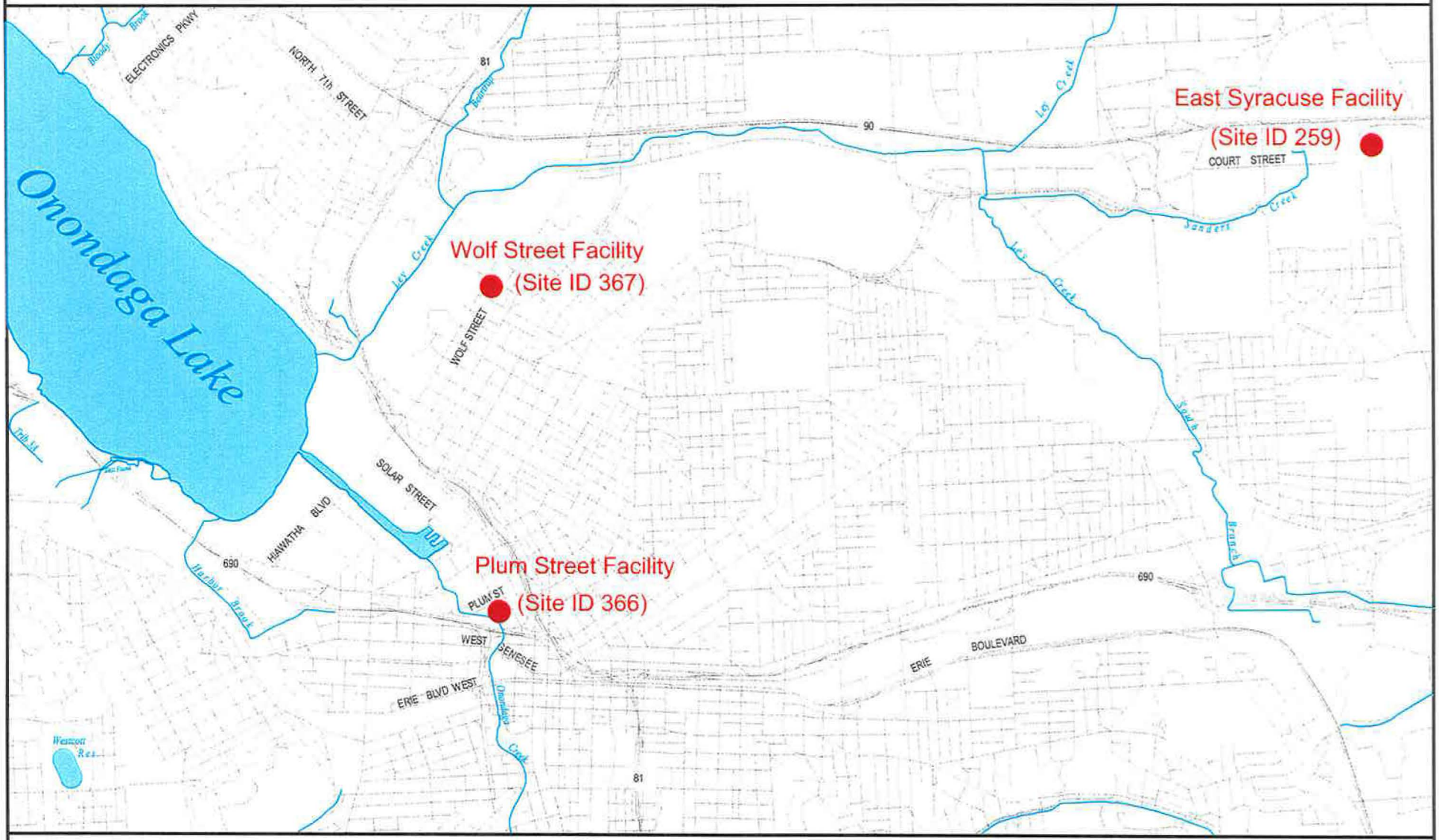
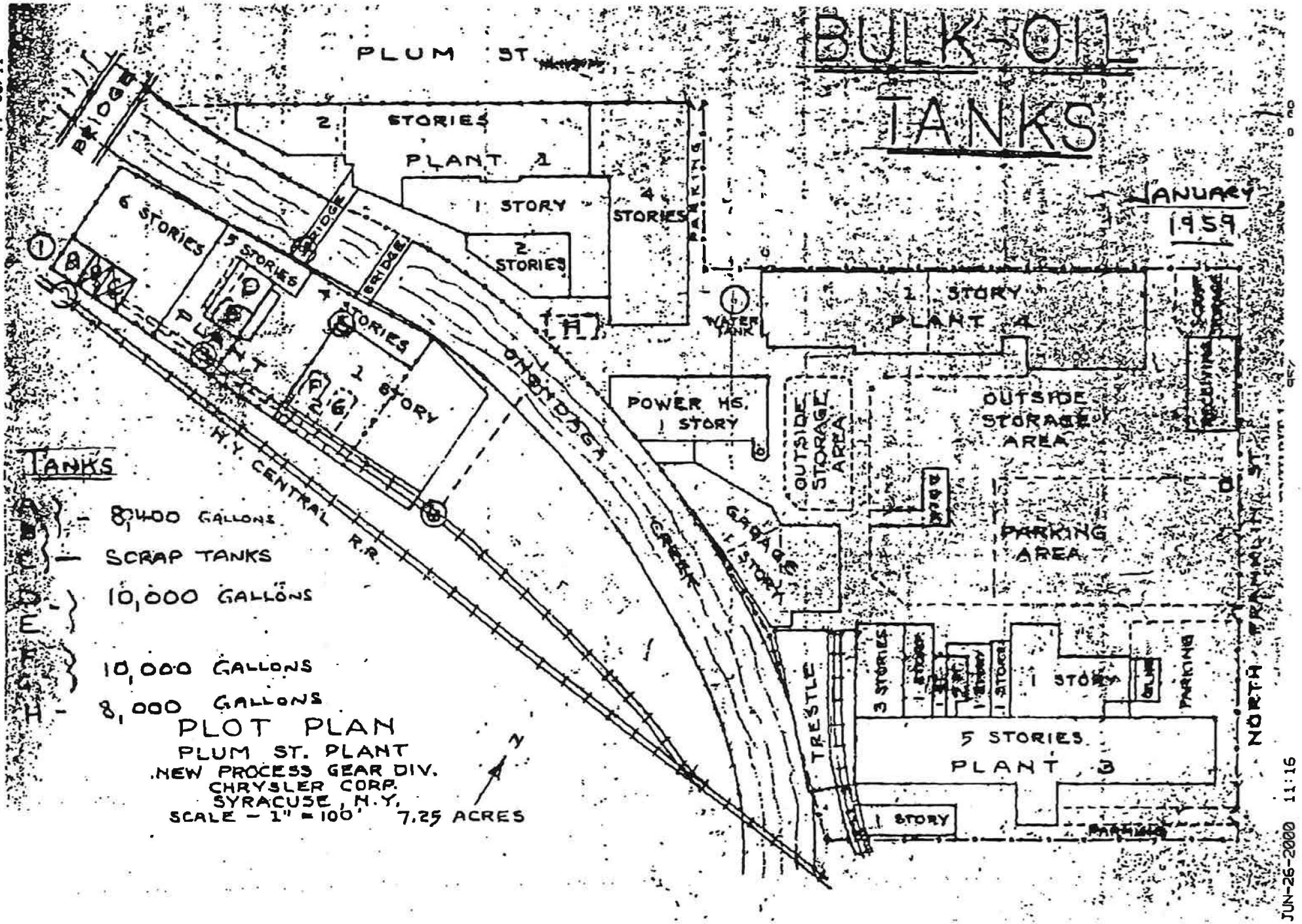


Figure 1



Source: New Venture Gear, Inc. (June 26, 2000)

Figure 2

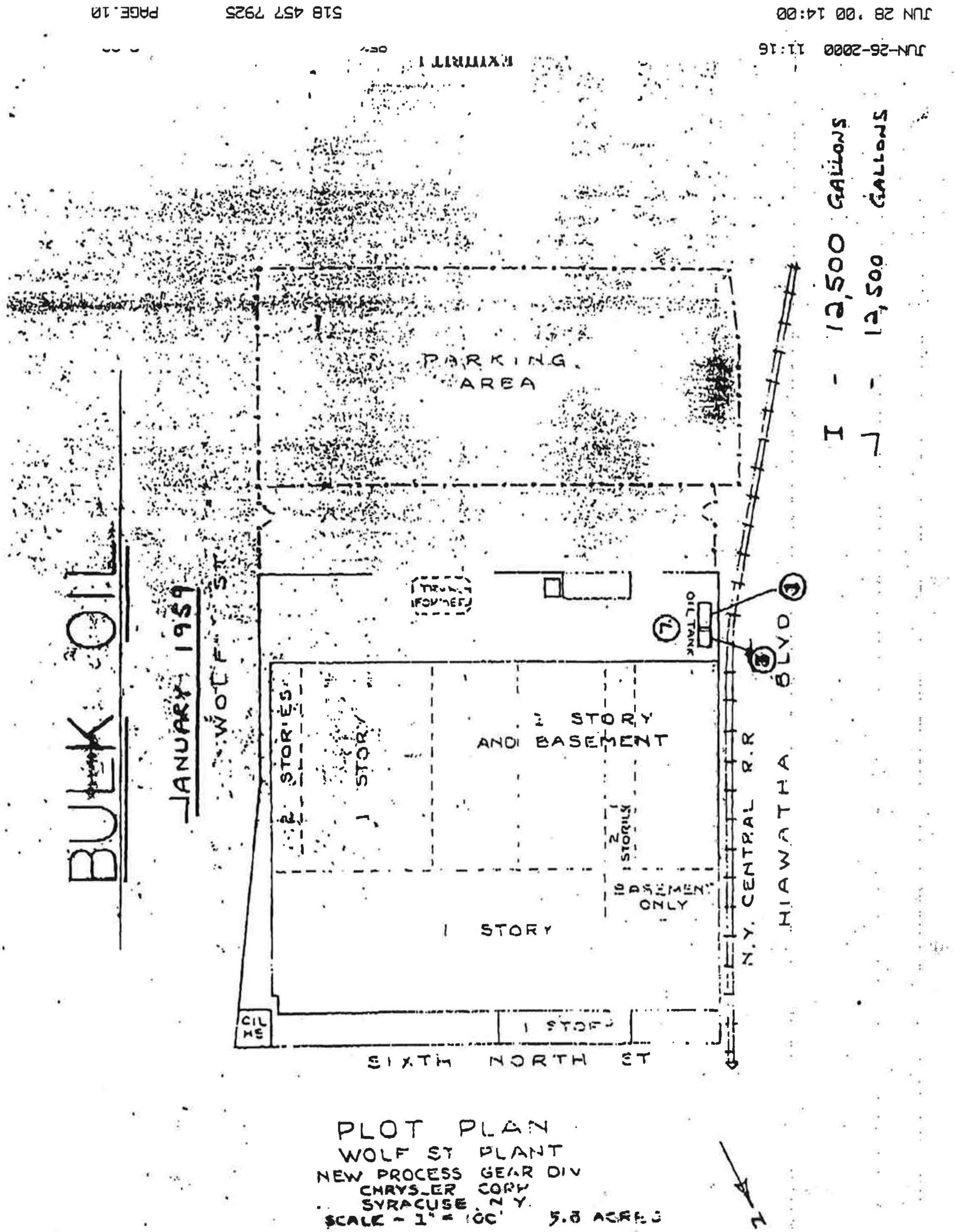


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Figure 3

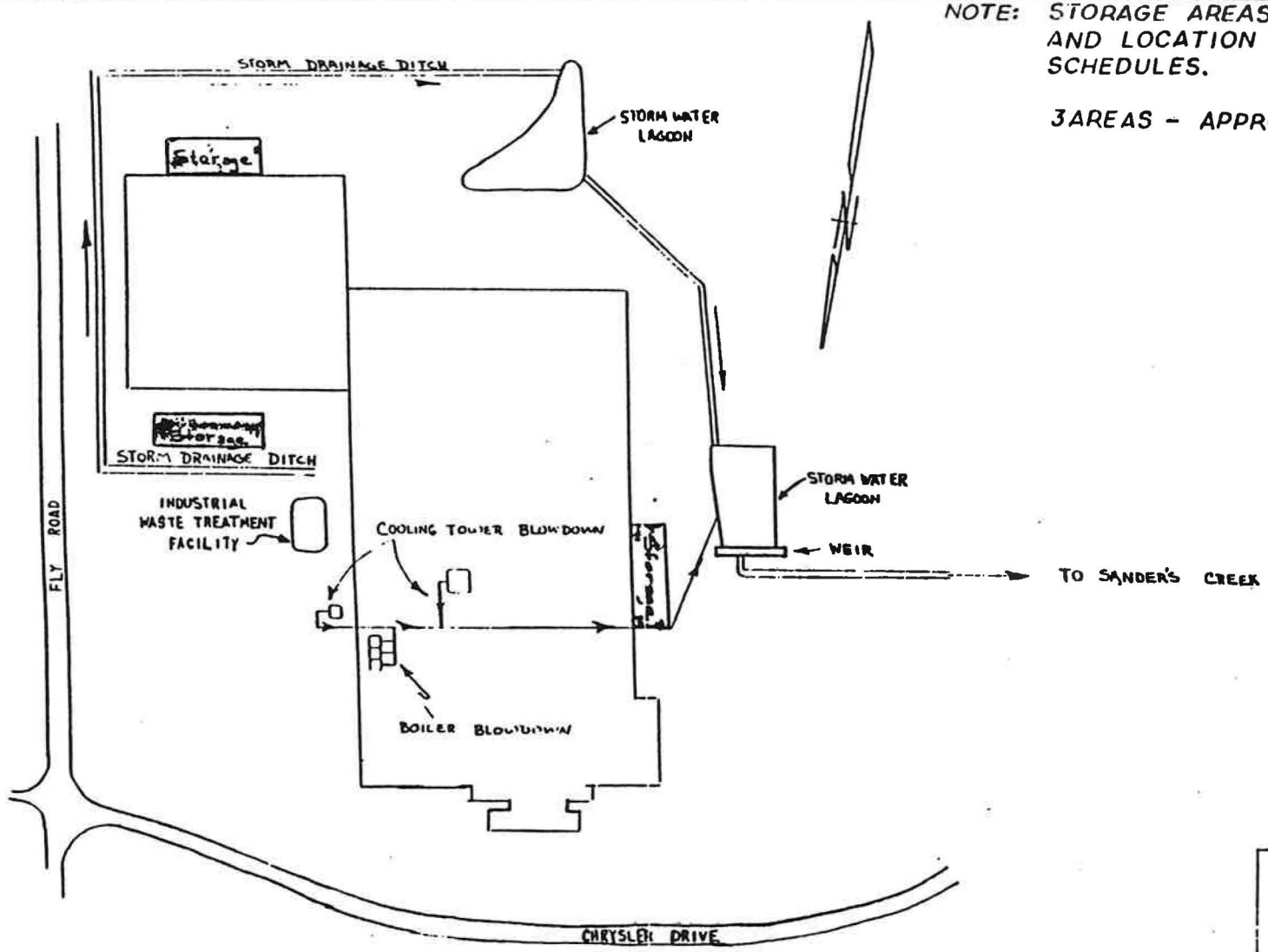


Figure 4

NEW PROCESS GEAR

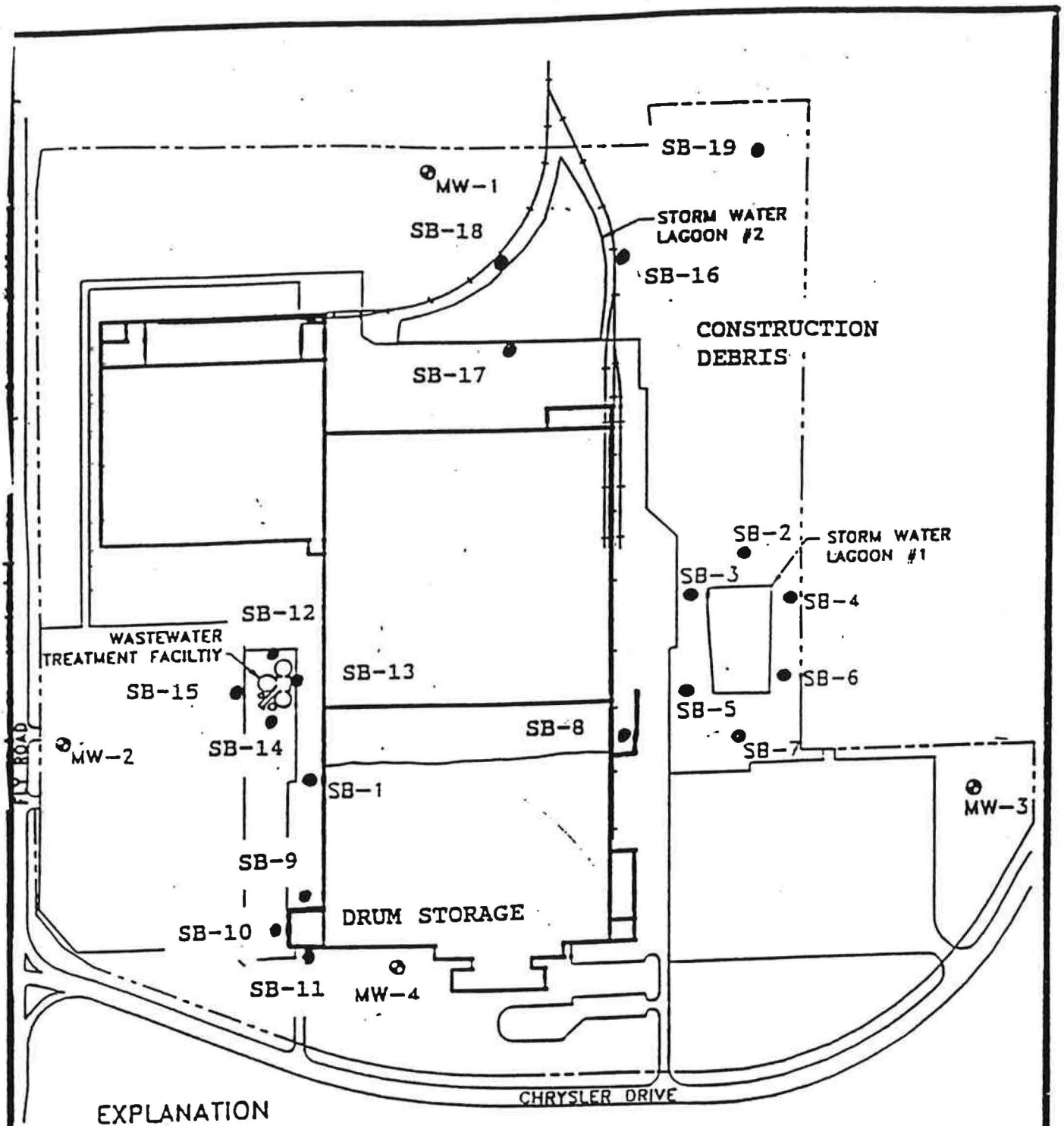
STORM DRAINAGE and

BLOWDOWN FLOW

10/24/85

ID. NO. NY0001384

Source: New Venture Gear, Inc. (June 1, 1995)



Source: New Venture Gear, Inc. (August 14, 1997)